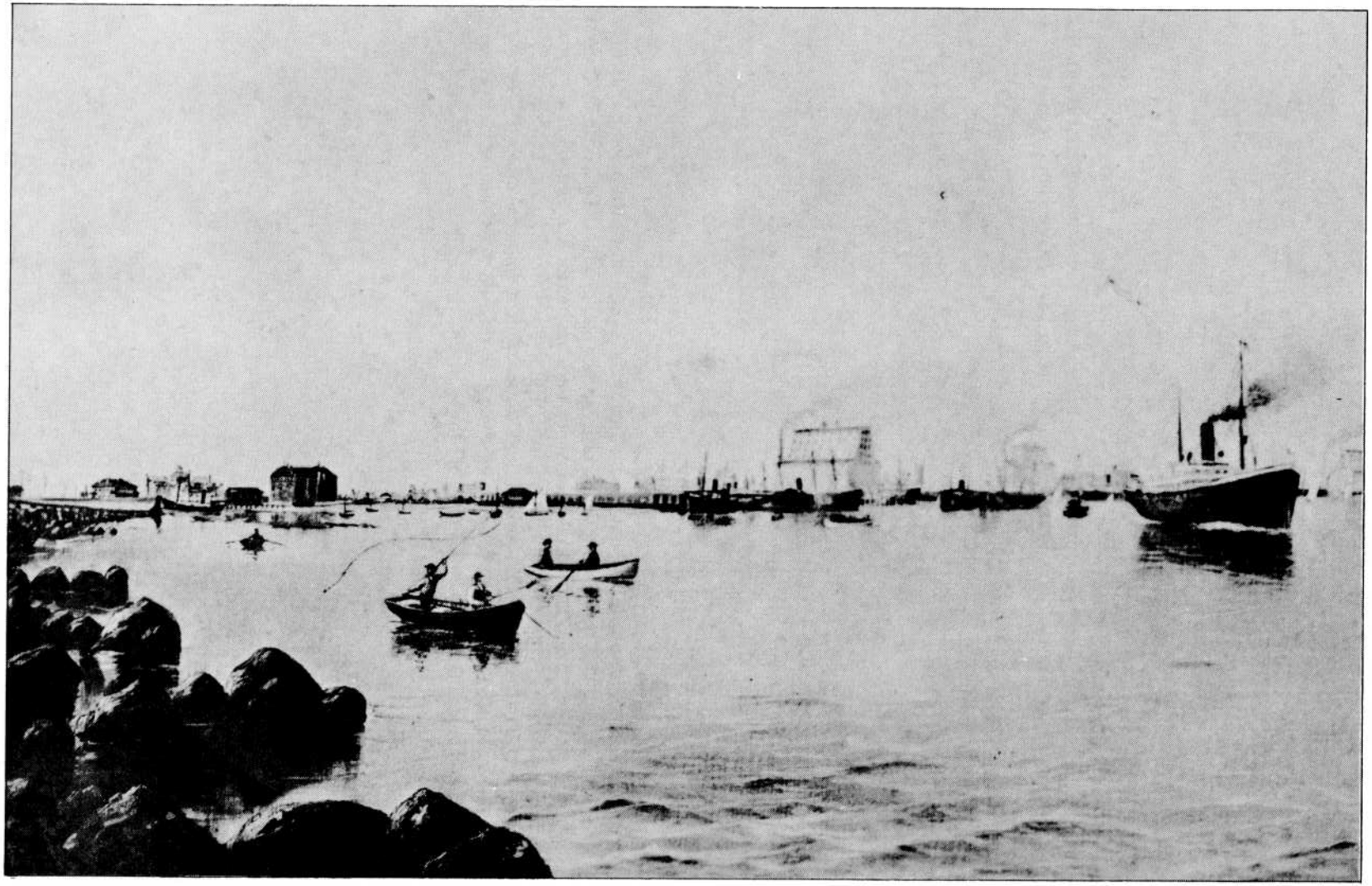


2

The Stubborn Sandbar

Galveston Island – Threshold to the Southwest

> One great disadvantage of the improvement of the Texas coast has been this, the headquarters of the engineer service in the southern section has been at New Orleans, and too much of the money appropriated has been spent on pet projects around that section; but now the prospects are that one or two engineers of high rank will be stationed with headquarters at Galveston to look after the coast of Texas, and in this event that coast will get its just proportion of the appropriations in the river and harbor bill.[1]

Such were the sentiments expressed by the *Galveston Daily News* at the outset of 1880. Texans in general and Galvestonians in particular clamored impatiently for more active federal participation in coastal improvements. Viewed against the background of developments which had occurred since Texas acquired statehood, their frustrations were understandable.

Soon after the United States annexed Texas late in 1845, the economic and political life of the young state presented a microcosm of the national preoccupation with transportation. In Texas, roads were poor; streams were not bridged and, in many cases, not navigable. Onerous freight expenses cut deeply into the profits of inland farmers and businessmen. Their cries grew louder and more insistent for some economical way to move the abundant produce of the interior — cotton, grain, cattle, lumber, wool, horses, cottonseed, hides, sugar, and molasses — to their respective markets.

Even before the railroad mania swept the country, the Republic of Texas had recognized the potential of the railroads, granting the first charter for a line as early as 1836. A number of additional charters were

Opposite page: Galveston Harbor in 1904 as depicted by artist Julius Stockfleth. Jetties and jetty railroad appear in left foreground, running from end of original county seawall near Eighth Street and Avenue D. (Rosenberg Library)

A glimpse of Galveston during the railroad era (Rosenberg Library)

subsequently issued, but insufficient capital and the relatively small population of the region conspired to keep an operating line from becoming a reality until 1853, when the Buffalo Bayou, Brazos and Colorado line put its first locomotive into operation.[2]

That same year, the Galveston, Houston and Henderson Railroad received its charter for a road between Galveston and Houston. Work began on the mainland at Virginia Point, just across the bay from Galveston Island, in 1856. The following year, citizens of Galveston voted $100,000 in bonds for construction of a 10,000-foot trestle to carry a railroad from Virginia Point to the island. The first train rolled across the bridge on February 9, 1860, affording the first direct rail connection between Galveston Island and the outskirts of Houston, some 40 miles away. This route was completed just in time to prove advantageous to the Confederacy during the Civil War.[3]

Not, however, until the period of Reconstruction did serious construction of railroads get underway in Texas. While Howell was struggling with his gabion jetties, the railroad craze was taking Texas by storm.

Rivalries for roads were intense; financial masterminds like the legendary Jay Gould bought and sold railroads while Wall Street reverberated from their cavalier transactions. Where Texas could claim but 711 miles of track in 1870, an extensive network of railroad lines stretched 3,257 miles across its vast expanses by the early 1880s. So rapid was this growth that four years later, in 1884, the state's track mileage had almost doubled to 6,166 miles.[4]

Even Galveston finally jumped into the act. The long-standing feud between Galveston and Houston grew progressively intolerable as Harris County slapped a series of yellow fever quarantines on Galveston, closing the island port and forcing its business to flow through Houston. Eventually came the quarantine that was one too many as far as the islanders were concerned. Incensed Galvestonians subscribed funds and obtained a charter in 1873 for a second railroad to the mainland — one that would bypass Houston! Local capital was used to "head off speculation and keep out outside influence."[5] Running 66 miles from Galveston to Rosenberg, where it met the San Antonio road, the new Gulf, Colorado and Sante Fe Railroad initiated service on December 22, 1879. Almost immediately came reports that the Galveston, Houston and Henderson was losing passengers to the new line. In a novel attempt to regain its patronage, the Galveston, Houston and Henderson rose to meet its competition with a "splendid inducement to the travelling public." On January 1, 1880, the 5:15 train to Galveston "left the union depot with a brass band going at full blast as the train pulled out."[6]

The railroad scramble provided a lively diversion, but it was merely the tip of the iceberg as far as Galveston was concerned. The port was the real lifeblood of the city and the Galveston Wharf Company was taking full advantage of it. As the only Gulf port of any consequence west of New Orleans, Galveston enjoyed a virtual monopoly on oceangoing commerce from those points in the interior that were not better served by the railroads to New Orleans. Fortunes were being amassed and the Galveston Wharf Company's grasping policies soon earned for it the epithet of "Octopus of the Gulf." In 1859, while acknowledging that most of the profits were reinvested in wharf improvements, the company paid $70,000 in dividends.[7]

Competitive efforts to undermine the wharf company's domination of the coast were futile. Two Texas ports offered only feeble challenge to Galveston's supremacy during the nineteenth century. Indianola Harbor on Matagorda Bay was established as a port in the early years of the Texas Republic. Its development was fostered by Commodore Charles Morgan, founder of the great steamship line that bore his name and became part of the Southern Pacific interests during the mid-1880s. Rivaling Galveston

as a center for German immigration, Indianola served as port of disembarkation for the camels imported for the ill-fated West Texas experiment. The hurricane that struck Lavaca Bay in 1875 inflicted extensive damage on Indianola, and the later fury of a storm in 1886 completed the job of removing all vestiges of the once bustling harbor.

The other port that emerged during these years was a fluke. An enormous log jam or raft caused the waters of the Red River to back up into its tributaries. In this fashion, Jefferson, a city northwest of Shreveport on Big Cypress Bayou, acquired deep water and enjoyed a successful interlude of port activity. The cotton of North and East Texas was transported from Jefferson to New Orleans. Jefferson became second to Galveston in the amount of Texas commerce it handled.

Pinning its hopes on the port, however, proved to be a disastrous error for this city. In 1873, army engineers from New Orleans succeeded in breaking up the Red River raft, causing the waters to recede slowly from the tributaries. Jay Gould approached Jefferson citizens to donate rights-of-way that would enable him to turn their city into a railroad center. The Jeffersonians spurned his overtures, failing to recognize the impending demise of their port as its waters gradually disappeared down the Red River. On January 2, 1882, Gould checked out of the Excelsior House in Jefferson for the last time, boldly inscribing in a flourishing hand on the hotel register, "End of Jefferson, Texas." His message turned out to be prophetic. Jefferson "dried up" and never again presented significant competition to other Texas ports.

Thus, the eyes of Texas and of points far beyond looked toward Galveston and, more specifically, toward the persistent outer bar that blocked navigational access to Texas and the greater Southwest. In 1840, Sheridan had noted, "The Bar never has as much as 15 feet upon it — 12½ & 13 being the average . . . ."[8] For the next forty years, deep-draft oceangoing vessels were forced to drop anchor in the Gulf and unload their cargoes onto shallow-draft lighters. The necessity for lighterage slowed the course of transport and the extra handling raised freight costs.

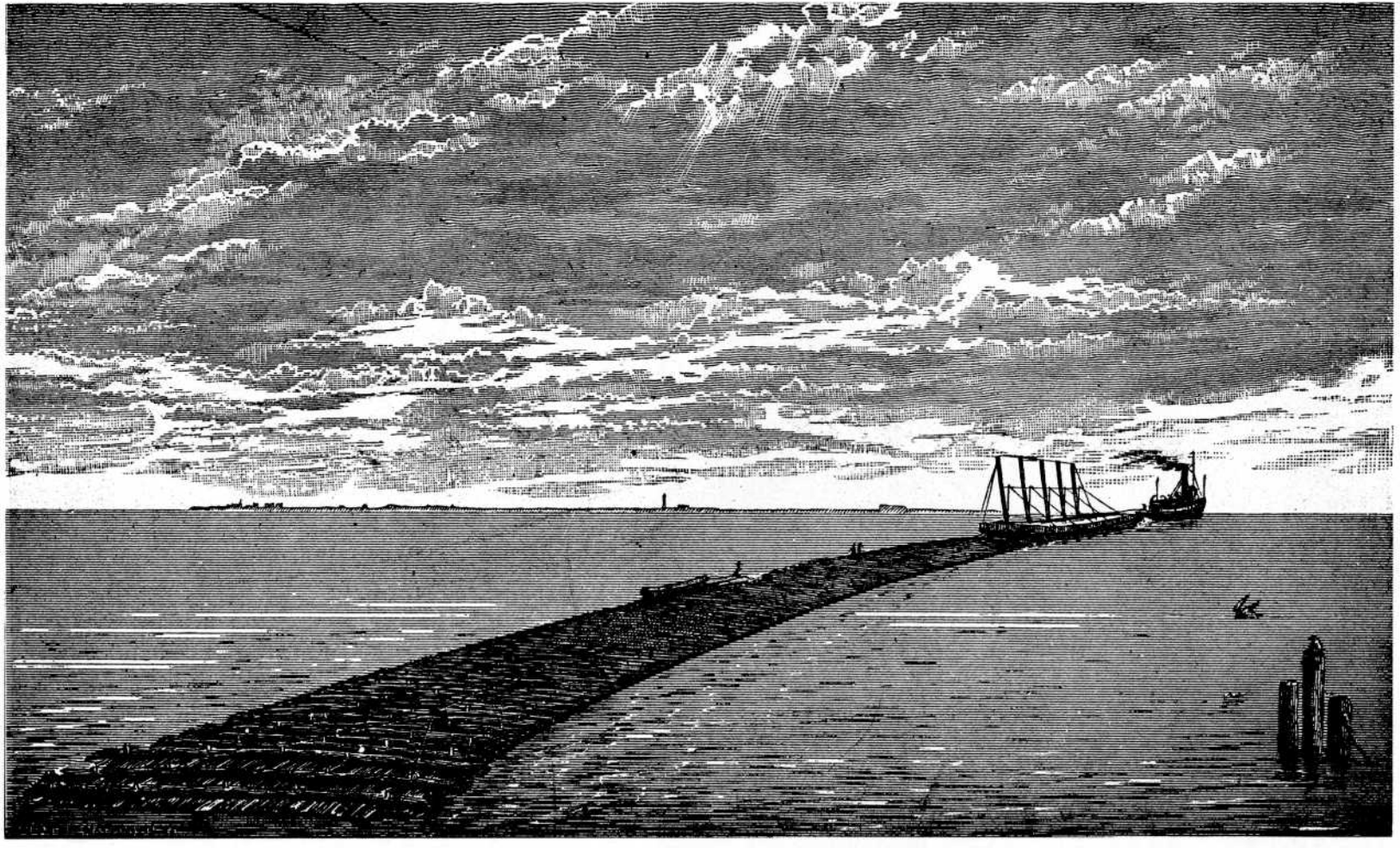
By 1880, the water over the outer bar had been deepened not a whit! Southwestern mercantilists, shippers, planters, and the citizens of Galveston — all had a vested interest in removal of the troublesome bar. Their determination was further nourished by the stunning accomplishment at the mouth of the Mississippi, where an 8-foot bar had obstructed passage to New Orleans and other ports on the mighty river. In the mere five years from 1874 to 1879, this bar had been scoured by the construction of jetties and a depth of 30 feet had been secured.[9] Could not the same be done for Galveston? Demands grew more insistent around the state.

The Strand in 1891, looking east from Bath, later named Rosenberg, Avenue (Rosenberg Library)

The Galveston Engineer Office

Coupled with their impatience was the Galvestonians' eager anticipation of an engineer officer to take charge of the Texas Coast. On January 9, 1880, the *Galveston Daily News* reported that steps were being taken to locate a high-ranking engineer in Galveston. That same day, Maj. (later Brig. Gen.) Samuel M. Mansfield was ordered to relieve Howell of the works in Texas. Mansfield arrived in Galveston on February 25, 1880, to officially take over river and harbor improvements in Texas and to establish the Galveston Engineer Office, precursor of the present-day "Galveston District."[10]

The engineer assigned to direct the operations of the new Galveston Engineer Office was in his fortieth year and a well-seasoned officer. Son of the distinguished Maj. Gen. Joseph K. F. Mansfield, Samuel Mansfield had followed in his father's footsteps, graduating sixth in his class at West Point on June 17, 1862. Soon participating in combat operations for the



Mattress jetty construction in Galveston Harbor, 1882

Department of the Gulf, he later gained valuable experience in fort construction, harbor defenses, and river and harbor improvements.[11]

In Galveston, Major Mansfield set up offices at Twentieth and Strand, the busy street named after the Strand in London and known as the "Wall Street of Texas" up until the turn of the century. His letterhead was elegantly imprinted "United States Engineer Office, Hendley Building."

Boundaries of the district for which Mansfield was responsible included all streams from the Sabine River to the Rio Grande. Mansfield promptly plunged into a number of projects up and down the Texas Coast. All had received some measure of attention under Howell's administration. Most had been examined and surveyed early in the 1870s and, by 1880, represented widely varying stages of progress.

Navigability of the Sabine and Neches rivers had been temporarily achieved and was being maintained by dredging and removal of obstructions. To maintain a 5-foot depth from the mouth of the Trinity River up to Liberty, dredging and snagging operations had been in progress since 1878. A project begun in 1871 now afforded a 9-foot-deep channel in Galveston Bay from the Gulf to the upper bay, from which ships continued on via Buffalo Bayou to Houston. Continuing on down the coast, the first appropriation was forthcoming in 1880 for construction of jetties at the mouth of the Brazos River. Still other proposals for jetty and groin construction at Pass Cavallo, Aransas Pass, and Brazos Santiago Harbor were ready to be launched. By the following year, Mansfield had begun work on them.

The most pressing matter was undoubtedly the outer bar at the entrance to Galveston Harbor. Thoroughly familiar with the project, Capt. C. E. L. B. Davis and Assistant Engineer H. C. Ripley were invaluable to Mansfield as he reviewed its history and planned a fresh attack on the impediment to this vital harbor. Desirability of the principle of a contracted channel remained unquestioned; how to achieve it was the problem. The board of engineers had advised switching from gabions to brush mattress and stone jetties, leaving construction details up to the engineer in charge. Accordingly, Mansfield experimented with different types and sizes of mattresses and prepared estimates for the north and south jetties which, depending upon the type of construction used, varied from $1,825,813 to $2,378,128. A 25-foot depth was anticipated from this improvement.[12]

The rivers and harbors act, passed on June 14, 1880, appropriated $175,000 for the Galveston Harbor improvement. Largest single appropriation to date, this sum still fell short of the estimated amount that could be profitably used. Meanwhile, Mansfield placed a "trial section" of mattress work and concrete ballast, 90 by 60 by 2½ feet, at the outer

end of the Bolivar gabionade (or north jetty). He then concentrated on the south jetty, where he steadily proceeded to lay a 22,551-foot foundation of mattress work and stone ballast. This was built up with additional courses (layers) of similar construction which progressively diminished in size as the jetty rose higher. By the end of 1882, the foundation layer had been completed and a second layer was nearing completion. The jetty had at least two, if not more, layers to be added before it would reach the projected height. Between the beginning of 1880 and August of 1882, Congress had appropriated a total of $825,000 for the Galveston Harbor improvement based on Mansfield's $1,825,813 estimate.[13]

Early in 1883, the rivers and harbors bill failed to pass. Watching progress in the harbor with more than casual interest, Galveston citizens were well-aware of the consequences of this failure. On March 9, Roger L. Fulton, mayor-elect of the city, asked Mansfield some pertinent questions: how long could he carry on the work with the funds he had, what would happen to the works should he have to suspend operations for want of funds, and how long a suspension would be anticipated? He further queried: how much money would be required to keep the work going during the summer and, if it were continued, what probable difference in depth of water on the bar would be produced?[14]

Major Mansfield replied that with a reduced force, he might be able to "drag along" the work until some time in June. The jetty itself would not be harmed significantly by an interruption in work, but plant deterioration would be considerable. He estimated $100,000 would keep the work going through the summer to complete the 4-mile south jetty to a height of mean low tide. He further stated, "I should be very much disappointed, however, if it did not result in a channel 18 feet deep by next fall." Still confident of the plan's eventual success, he added, "there is no engineering difficulty in the way; it is a mere question of dollars and cents."[15]

Acting with remarkable dispatch, Galveston city officials secured passage of legislation within a month. On April 7, 1883, the Texas legislature approved an act (H.D. 543) authorizing coastal cities to issue bonds for improvement of their harbors. Under this law, a city ordinance authorized issuance of $100,000 in bonds yielding 5 percent interest "to aid in deepening water on the Galveston Bar." The funds were to be used by the army engineer in charge of the specified harbor improvement. By mid-May, Mansfield had been given authority from the chief of engineers and the secretary of war to receive the city appropriation. For the time being, continuance of the work was assured.[16]

Where Is That Eighteen Feet of Water?

By fall of the year 1883, anticipation was understandably running high for encouraging results from the jetty. Having underwritten the work, the citizens were busy giving harbor developments careful scrutiny, some even taking it upon themselves to take their own soundings of the depth over the bar.

On September 3, a scathing letter to the *Galveston Daily News* from Lorenzo C. Fisher was published, bearing the belligerent heading, "Where Is That Eighteen Feet of Water?" An inveterate letter writer and former mayor of the city, Fisher did not mince words:

> The 1st of September, 1883, has come, and is now numbered with the past. Its arrival was not made memorable by the announcement in your columns that eighteen, or even fifteen feet of water had been secured on the bar. There was an absence of information on that subject in your local columns that day, which was ominous, and almost painful, to many people who had been taught to hope so much.[17]

Fisher ranted at great length and with considerable sarcasm on the shortcomings of the government efforts. He suggested in no uncertain terms that the "general" government stand aside and let other engineering talent take on the job of deepening the harbor.

In the days that followed, the *News* was deluged by letters. Thousands of words were printed and the paper was filled with articles, editorials, interviews, and letters, all hotly debating every conceivable ramification of the controversy. Whether qualified or not, each writer expounded his ardent opinion. Fisher inaccurately accused the army engineers of ignoring the destructive effects of the teredo navalis, a worm that plagues the Gulf Coast by feasting on exposed wooden beams. This charge was followed by a letter helpfully offering the latest defense in the fight against the pesky teredo, "a compound solution of pysolignous and carbolic acids."[18] In fact, the government engineers had believed that sand would fill the interstices of the brush and protect it from the teredo.[18]

In the crosscurrent, Capt. Charles Fowler of the Morgan interests patiently explained the need for "a strong gale from the eastward" to fill the bay, "followed by a norther, driving the water out over the bar" to scour away the obstruction. Predicting a consequent gain of 2 or 3 feet, he declared, "then the croakers will cease to croak, and I look for such a

Looking east from Williams and McKinney wharf, 1884-90 (Rosenberg Library)

result as sure as I look for the sun to rise tomorrow."[20] In response, Fisher ridiculed, "Is it seriously contemplated that in order to complete the present plan of harbor improvements the storm king is to be called in?"[21] Indeed, Mayor Fulton sounded a trifle dubious when, in an interview reported on September 8, he stated:

> When I recommended the appropriation of $100,000 to aid in the undertaking I could not find one to find fault with the suggestion, but before one-half of the amount was expended the raven perches upon our door and croaks, "Nevermore."[22]

Even the most outspoken opponents of the government enterprise took pains to avoid inpugning Mansfield personally. It appears that this officer conducted himself with the professional dignity befitting his rank and enjoyed considerable respect and acceptance by the local citizenry, despite the periodic assaults upon his work that permeated the daily newspaper.

Mansfield remained steadfast in his confidence that the jetty plan would result in success. In fact, not half of the money estimated for the jetty project had been expended, the north jetty remained to be built, and the

small, but steady, increments of increased depth had amounted to 2 feet already.

One contingent of local people rose to Mansfield's defense. Joining Captain Fowler, Capt. Jerry Sawyer of the Mallory Lines pointed to the progress already made, indicating that the 2 feet added to the depth over the bar was saving the Mallory Lines about $2,250 on each full cargo by reducing the lighterage expenses.[23] More conservative citizens expressed disappointment and impatience, but were careful in their placement of blame for the failure:

> The plan, for aught I know, may be a good one, and Colonel Mansfield is doubtless a good engineer. My objection is to the restricted method of the government dispensation of funds.[24]

This attitude echoed the analysis that had frequently punctuated the news to the effect that, "There has been entirely too much dependence upon Congress for this class of work, and with unsatisfactory results."[25]

A former state senator, Robert G. Street, joined the dissatisfied ranks of Fisher's camp and urged the city council to take the matter out of the hands of the army engineers and to "forthwith engage the first engineering skill in the land . . . ."[26] His innuendo, if it may be so considered, was far from subtle.

It was inevitable that the name of James B. Eads should crop up in discussions pertaining to the jetty issue. A self-made civil engineer, the unorthodox and controversial Eads had to his credit brilliant successes in the bridge spanning the Mississippi at St. Louis and in the opening of the South Pass of that river. Parallels to the situation at the South Pass were bound to be drawn. Eads had gone to enormous effort to secure sufficient financing to push his project through to successful completion, charging Congress afterwards predetermined sums according to each foot of depth achieved. "No water, no pay," was the formula upon which he had negotiated these works.

In an interview published October 16, Mansfield explained the differences between his situation and that under which Eads had labored:

> The work of Captain Eads at the mouth of the Mississippi river is somewhat different. His problem was the improvement of the mouth of a river, mine the improvement of a tidal harbor. His jetties are about two miles in length, mine about four miles. He has received from the government about $5,000,000, while differences in conditions of construction are alike wide apart. With his material close at

> hand, with unlimited funds and smooth water enabling the work to go on uninterruptedly, he has been enabled to attain success, while I have labored against difficulties that seemed almost impossible to surmount. Materials have come in slowly and our work is all out at sea, and the means for carrying it on have been inadequate to its rapid and proper conduct. We shall, however, having gone so far, now carry it through, for we have demonstrated beyond any question its entire practicability.[27]

On one point, Mansfield and Eads were in perfect accord; both shared the sentiment that there was no engineering problem that could not be solved with the support of adequate financing.

The movement for Galveston to take more aggressive action was gaining momentum. On October 15, a resolution was introduced at the city council meeting to appoint a committee,

> . . . for the purpose of procuring the services . . . of a civil engineer, or engineers of approved skill to make surveys, plans and estimates for obtaining deep water at this port.[28]

A deep-water committee was named immediately. The following week, Alderman Norris Wright Cuney moved that the resolution to appoint the committee be reconsidered and amended, because he had heard the intimation that the previous action might be construed as an affront to the government engineer. He added that the committee should confer with Major Mansfield before taking final action. This resolution was postponed, however, and the matter was temporarily tabled.[29]

Excitement over the deep-water committee and the prospect of approaching Eads overshadowed the announcement on October 28 that the British steamship *Prior*, drawing 15 feet of water, had crossed the bar and come to the Galveston wharves. This latest "triumph" topped the record of 14 feet 10 inches set by the *Empress* in October, 1882; but it attracted relatively little public attention, offset by a special article from New York two days later that reported Eads as being confident of securing results in Galveston and willing to undertake the work if called upon to do so.[30]

"Is it Eads or Mansfield? the civil or the military engineer?" The *Houston Post* pitted one against the other and defined the extremes of the controversy, indicating that "the people of Houston have a stake in deep water here scarcely secondary to that of Galveston herself. . . ."[31]

The city council moved into action on Monday, November 5, 1883. With some rewording and assurance that Mansfield was not intended to be

slighted, the resolution was adopted that the mayor appoint a committee to communicate with Eads regarding the goal of a 20-foot depth across the bar. Mayor Fulton named a new committee. By Friday of the same week, a subcommittee had drafted a letter and submitted it for public endorsement by the mayor, city council, Cotton Exchange, leading corporations, and the commercial community at large.[32]

Dated November 8, 1883, the letter asked Captain Eads: would he be willing to undertake the work of deepening the water on Galveston bar to the extent of 25 or 30 feet and, if so, how long would it take? how much would it cost? and for what per annum would he guarantee to maintain the depth agreed upon? The committee promised Eads cooperation in securing "the necessary congressional assistance."[33]

The year had almost run out when Mayor Fulton received Eads's reply, written December 6 in London, where Eads was attempting to restore his frail health. Published in its entirety on December 28, Eads's letter stated he would be willing to undertake the work,

> . . . if Congress would pass an act sufficiently liberal in its provisions to secure a rapid prosecution of the works, and . . . leave me untrammeled in their location and design, as well as in their construction, . . .

If he were allowed to work under conditions similar to those that obtained at the South Pass, he would secure "a permanent channel . . . not less than 30 feet deep at average high tide." Indeed, he indicated, with the current demands of waterborne commerce, a depth of less than 30 feet should not be contemplated by the city of Galveston. Allowing that the "problem presented is a much more complicated and difficult one than that at the mouth of the Mississippi," he proposed changing the location of the jetties and raising the height above high tide. Eads estimated a depth of at least 20 feet could be achieved within two years and about 2 or 3 feet each year thereafter until reaching a 30-foot channel depth. The greater magnitude of the Galveston jetties and the more exposed location of the works, which would increase danger of injury to the works and equipment, naturally raised the cost. Eads estimated $7,750,000 and offered to guarantee the work for ten or twenty years at $100,000 per annum.[34]

Eads's proposal was embraced enthusiastically by the Texas legislators, citizens, and press. Work began on a bill to be submitted to Congress. Mansfield clipped Eads's reply and forwarded it to the chief of engineers in Washington. Late in January, 1884, he stated the necessity for an immediate appropriation. His plea was in vain; in fact, no funds were appropriated for improvements in Galveston Harbor during the four

years from August, 1882 until August, 1886, although other projects along the Texas Coast were funded.[35]

On May 22, 1884, Eads appeared before the Rivers and Harbors Committee. He recommended 2,000 feet as a maximum width between the jetties, a considerably greater contraction of the channel than the 7,000-foot width adopted by the Corps would produce.[36]

The bill embodying Eads's proposal was introduced in Congress in January of 1885. It stimulated several days of heated debate between the proponents of James Eads and those who took a dim view of the enormous sums this engineer had already extracted from the national treasury. Finally, an alternate provision was attached to the bill that Eads be hired as a designer or contractor and paid an annual salary of $3,500 to conduct the work. As such, the bill was dropped into an omnibus rivers and harbors bill. In the end, an insulted Eads withdrew his proposal and the unfortunate rivers and harbors bill plummeted to defeat.[37]

An examination of the south jetty made in June, 1885, showed that the average height had diminished by 5.77 feet or 61 percent. Lack of money and cessation of the work in 1883 had left no chance to cover the jetty with stones large enough to resist displacement. Prolonged exposure to ravages of the teredo and the wash of the breakers resulted in the more than 4-foot subsidence, caused by compression of the brush mattresses, destruction of top mats by wave action, and undermining by scour. The jetties had not settled bodily into the sand.[38]

In January of 1886, a new board of engineers, consisting of Col. J. C. Duane, Lt. Col., Henry L. Abbot, and Lt. Col. Cyrus B. Comstock, was convened to review the issue of the Galveston jetties. Rapid growth of commerce since 1880 had increased depth requirements, adding somewhat to the problem; however, other circumstances had changed sufficiently to give the project a more favorable prognosis. Stone was now readily available at reasonable cost and considerable data had been gained from the previous experience in constructing the earlier jetties. The board found itself called upon less to study the details of jetty construction than to determine the general principles governing their location.[39]

The board concluded there was little to be gained by building jetties closer together than 7,000 feet, but much to be lost. Greater channel contraction would lessen tidal oscillation, thereby increasing the risk to existing channels by diminished currents; it would also increase the danger of undermining the jetties themselves and the liability of Galveston Island to overflow in a storm. Therefore, the engineers settled upon a plan for converging jetties, 7,000 feet apart at their outer ends. The body of the jetty would be constructed of rubble stone, underlaid by a single brush mattress; the top of the jetty would rise 5 feet above mean low tide

and be capped with concrete. The rubble slopes were to be covered with heavy stone blocks, weighing from six to eight tons each, and the outer portion was projected as a solid concrete pier.[40]

Maj. (later Maj. Gen.) Oswald H. Ernst replaced Mansfield in the Galveston Engineer Office on November 22, 1886. In later years, Ernst would assume the responsibility for public buildings and grounds in Washington, D.C. and serve as superintendent of the U.S. Military Academy. His distinguished career culminated in his appointment as president of the Mississippi River Commission in 1905.[41]

In addressing himself to the matter of the Galveston jetties, Ernst began work with $300,000 appropriated by Congress on August 5, 1886, the first appropriation for this work since 1882. A contract was signed with A. M. Shannon & Company to raise the old south jetty. Beginning with stone and clay construction on the shore arm, work was resumed in July, 1887, ending a suspension of more than three years. Following another three-month interruption during the summer of 1888, a new $500,000 appropriation enabled further progress. By August, 1890, the new south jetty extended over 19,000 feet from the corner of Avenue A and Ninth Street in the city of Galveston out into the sea. And, once again, funds were exhausted.[42]

Deep Water at Last

Although jetty construction under the project adopted in 1886 reflected greater success than the earlier projects, progress remained slow. Little change had been realized over the outer bar. Fortunately, a combination of events occurred around 1890 to radically improve the outlook for deep water in Galveston Harbor.

The phenomenal development of the Midwest and Southwest during this period spurred the already widespread demand for a deep-water outlet on the Gulf Coast. Not only were the economic interests of the immediate area straining, but producers as far distant as California and beyond were handicapped by having no available port closer than New Orleans. The vital link envisioned across the isthmus of Panama, longed for by so many for so long, had bogged down in a morass of bankruptcy and disease. Calls for a deep-water harbor on the Texas Coast grew louder and more urgent than ever before.

In a sense, Howell's plea in 1871 had been prophetic. Although it fell on deaf ears at the time, the principle which prompted him to recommend not spreading the rivers and harbors appropriation too thin was being gradually embraced during the 1880s. An appreciation of the changing conditions of commerce was leading to the realization that railroad combines

and centralization of business were setting a new trend in the nation's growth. Fewer harbors, but bigger and better ones, became the new order of the day.

Beginning late in the decade, conventions were held in a number of interior cities — Fort Worth, Denver, Topeka, and Omaha — for the purpose of obtaining such a harbor to serve the greater Southwest. The first step was to select the most desirable location. A resolution was presented to Congress, requesting that a board of federal engineers be appointed to choose among the contending sites.

In response, Congress passed an act on March 2, 1889, directing the secretary of war to appoint three engineer officers to:

> . . . make a careful and critical examination of the northwest coast of the Gulf of Mexico, west of ninety three degrees and thirty minutes west longitude, and report as to the most eligible point or points for a deep harbor, to be of ample depth, width, and capacity to accommodate the largest ocean-going vessels and the commercial and naval necessities of the country, which can be secured and maintained in the shortest time and at the least cost. . . .

An appropriation of $2,000 was provided to cover the expenses incurred by this engineer board.[43]

Three lieutenant colonels, Henry M. Robert, George Lewis Gillespie, and Jared A. Smith, were named. On May 6, these officers assembled in New Orleans to begin their whirlwind tour of the Louisiana and Texas Gulf Coast. After preliminary study of charts and surveys, they examined Sabine Pass, the entrance and harbor at Galveston, Aransas Pass, Brazos Santiago Harbor and Port Isabel, Pass Cavallo, and the mouth of the Brazos River. Along the way, they held public meetings and met with groups of businessmen whose interests would be served by the development of a particular port. When their inspections were completed, the engineers traveled inland to meet with citizens in San Antonio and with the governor at the state capitol in Austin. Returning to Galveston, the board adjourned on May 20 to allow its members time to digest the considerable amount of data they had collected.[44]

The board of engineers reconvened in Philadelphia for a couple of days in September and again early in December to finalize its report. The engineers specified that, to be worthy of consideration as a deep-water harbor, a potential harbor must be:

> . . . an inner harbor to which an entrance having a clear width of not less than 2,000 feet, a cross-sectional area of not less than

> 43,000 square feet, and a depth of not less than 30 feet for a width of 600 feet, can be secured and maintained.[45]

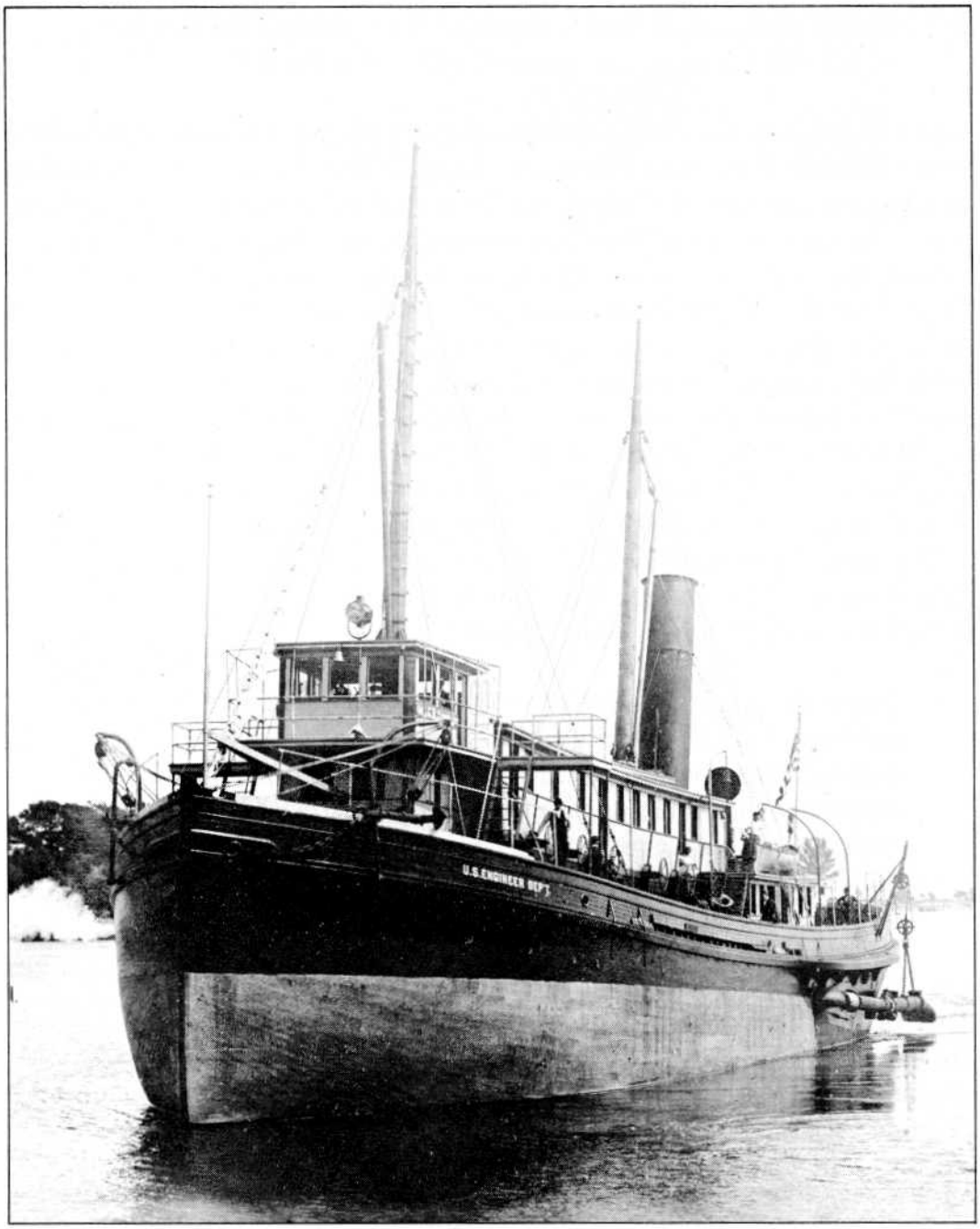
Using these guidelines, they narrowed down their deliberations to Sabine Pass, Aransas Pass, and Galveston. Despite the disadvantage of having the longest distance for which works would have to be constructed to reach the deep water of the Gulf, Galveston was favored for having the largest area of deep water, the most central location to accommodate Texas and the other states seeking a deep-water harbor, and the best railroad facilities along the coast. In their report dated December 11, 1889, the engineers concluded Galveston Harbor was "the most eligible point" — indeed, the only point — fulfilling all the requirements of the act.[46] They recommended that the $6.2 million balance of the $7 million required for completion of the jetties as estimated by the 1886 board should be appropriated as soon as practicable.

The year 1890 marked the turning point for the Galveston Harbor improvement. The change was manifest in the rivers and harbors act signed late in September which stated:

> Improving entrance to Galveston Harbor, Texas: Continuing improvement, five hundred thousand dollars: *Provided*, That contracts may be entered into by the Secretary of War for such materials and works as may be necessary to carry out the plan contained in the report of the Chief of Engineers for eighteen hundred and eighty-six for the improvement of that harbor, to be paid for as appropriations may from time to time be made by law.[47]

This provisional clause shot down what had been the greatest single obstacle to success, the cumbersome and costly policy of partial appropriations by Congress. No more would the Galveston jetty project be plagued by exhausted appropriations, repeated work stoppages, and the extravagant waste of incomplete works left to deteriorate in the intervals between contracts. This time it was understood that, although the act specified $500,000, the larger sum of $6.2 million (and still more if necessary) would be forthcoming and actually furnished as required to allow the work to proceed continuously to its completion. Galveston was jubilant.

From then on, the course of the Galveston jetties moved smoothly and rapidly. Maj. Charles J. Allen, who had relieved Major Ernst late in 1889, wound up the Shannon contract. With the assistance of General Comstock and other members of the 1886 board in preparing the specifications, he administered a new contract with the firm of O'Connor, Laing & Smoot which began work on the south jetty in August of 1891.



First self-propelled U.S. hopper dredge to work in Galveston Harbor, the General C. B. Comstock *replaced the hydraulic dredge* Jumbo, *which had to be towed by tugboat. Equipped throughout with electric lights, the* Comstock *boasted hopper capacity of 600 cubic yards. The hoppers could be filled in 1½ hours and dumped in 8 minutes. This $86,000 vessel, built in 1895, served the district until 1913.*

Construction procedures were varied according to the nature of the different reaches in the jetty. Maj. Alexander Macomb Miller took over the district in the spring of 1893 and the final work was conducted under his administration.[48]

The *Belgian King* crossed the outer bar drawing 24 feet 7 inches on May 16, 1897. In ten years, the depth across the bar had almost doubled. By 1898, the depth over the outer bar was 25½ feet and over the inner bar, 26 feet. The channel between the jetties had been straightened since 1895 by the new U.S. hopper dredge *Gen. C. B. Comstock*. Considered complete in 1897, the south jetty extended a length of 35,603 feet; the north jetty extended 25,907 feet.[49]

Lt. William V. Judson, who served in Galveston under Major Miller until February of 1897, compared with no small measure of pride the aggregate length of the world's major jetties:

Galveston	61,500 feet
Mouth of Mississippi	20,000 feet
Columbia River	25,000 feet
Charleston	34,000 feet
Sulina mouth of Danube	8,400 feet[50]

Deep water had become a reality for Galveston at last! Over the ensuing years, assisted by periodic maintenance dredging and subsequent channel modifications, the jetties have served well the ports on Galveston Bay. In 1975, the ports of Galveston, Houston, and Texas City handled almost 78 million tons of cargo that passed through the Galveston jetty channel. But although the dream of deep water for Galveston had been fulfilled with completion of the jetties in 1897, undreamed of changes were in store for the Texas Coast with the turn of the century.

Notes to Chapter 2

[1] *Galveston Daily News*, 1 January 1880.

[2] Marilyn McAdams Sibley, *The Port of Houston* (Austin and London: University of Texas Press, 1968), pp. 35, 62-63.

[3] Robert A. Nesbitt, *Rails onto Galveston Island: A Very Brief History and Eleven Prints of Locomotives, Interurbans and Maps* (Galveston: Port of Galveston, 1974).

[4] S. Misc. Doc. 111, 48th Cong., 1st sess. (1884), p. 7.

[5] *Galveston Daily News*, 1 January 1880.

[6] *Ibid.*, 2 January 1880.

[7] Earl Wesley Fornell, *The Galveston Era: The Texas Crescent on the Eve of Secession* (Austin: University of Texas Press, 1961), p. 18.

[8] Francis Sheridan, *Galveston Island: The Journal of Francis C. Sheridan 1839-1840*, ed. Willis W. Pratt (Austin: University of Texas Press, 1954), pp. 44-45.

[9] Florence Dorsey, *Road to the Sea: The Story of James B. Eads and the Mississippi River* (New York and Toronto: Rinehart & Company, Inc., 1947), pp. 178, 215.

[10] Adjutant General's Office, Special Order (SO) 6, 9 January 1880; *Annual Report of the Chief of Engineers to the Secretary of War for the Year 1880* (Washington, D.C.: Government Printing Office, 1880), pp. iii, 1205 (hereafter cited as *ARCE*, followed by date of fiscal year covered in report).

[11] George Washington Cullum, *Biographical Register of the Officers and Graduates of the U.S. Military Academy at West Point*, 3d ed., rev. and ext. (Boston and New York: Houghton, Mifflin and Company, 1891), 2: 849-50.

[12] *ARCE, 1880*, p. 1218; William V. Judson, "Report on Galveston Harbor" (Typed report, [1897]), p. 14, Galveston District Installation Historical Files.

[13] *ARCE, 1883*, pp. 1059-60.

[14] *Ibid.*, p. 1062.

[15] *Ibid.*, p. 1063.

[16] *Ibid.*, pp. 1067-69.

[17] *Galveston Daily News*, 3 September 1883.

[18] *Ibid.*, 3 September 1883; 11 September 1883.

[19] Judson, "Report on Galveston Harbor," p. 14.

[20] *Galveston Daily News*, 6 September 1883.

[21] *Ibid.*, 1 October 1883.

[22] *Ibid.*, 8 September 1883.

[23] *Ibid.*, 17 October 1883.

[24] *Ibid.*

[25] *Ibid.*, 14 September 1883, quoted from *New York Maritime Register*.

[26] *Ibid.*, 5 October 1883.

[27] *Ibid.*, 16 October 1883.

[28] *Ibid.*

[29] *Ibid.*, 23 October 1883; 24 October 1883.

[30] *Ibid.*, 28 October 1883; 30 October 1883.

[31] *Ibid.*, 2 November 1883, quoted from *Houston Post*.

[32] *Ibid.*, 6 November 1883; 9 November 1883.

[33] *Ibid.*, 9 November 1883.

[34] *Ibid.*, 28 December 1883.

[35] Dorsey, *Road to the Sea*, p. 279; Docs. 13 and 339, Record Group 77, Letters Received, National Archives, Washington, D.C.

[36] Judson, "Report on Galveston Harbor," pp. 19-20.

[37] Dorsey, *Road to the Sea*, pp. 279-80.
[38] *ARCE, 1886*, pp. 1321, 1315-16.
[39] Judson, "Report on Galveston Harbor," p. 17.
[40] *ARCE, 1886*, p. 1307; Judson, "Report on Galveston Harbor," p. 19.
[41] Judson, "Report on Galveston Harbor," p. 24; U.S. Military Academy Association of Graduates, *Annual Report*, June 1926, p. 173.
[42] Judson, "Report on Galveston Harbor," pp. 24-25.
[43] Act of Congress of March 2, 1889, ch. 411, 25 Stat. 939.
[44] Corps of Engineers Headquarters, SO 29, 16 March 1889; *ARCE, 1890*, pp. 1781-82.
[45] *ARCE, 1890*, p. 1793.
[46] *Ibid.*, p. 1796.
[47] Rivers and Harbors Act of September 19, 1890, ch. 907, 26 Stat. 426.
[48] Judson, "Report on Galveston Harbor," pp. 30-31.
[49] *ARCE, 1897*, p. 1796; *ARCE, 1898*, p. 1492.
[50] Judson, "Report on Galveston Harbor," p. 35.